Darshan Thakur

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Professional Summary

Mechanical Engineer with MSc in Mechanical Engineering and over 3 years of design, simulation, and optimization experience across defense, mobility, and consumer domains. Skilled in CAD (SolidWorks CSWP), and hands-on research in 3D printing, thermal management, and sustainable product development.

Education

Trinity College Dublin, MSc Mechanical Engineering Sept 2024 – Sept 2025

- **Grade:** 1:1 (Distinction)
- **Focus Areas:** Advanced Product Development, Computational Analysis, and Zero-Carbon Technologies

Mumbai University, BE Mechanical Engineering July 2018 – August 2021

- **Grade:** 8.92 / 10
- **Focus Areas:** Finite Element Analysis, Industrial Automation, Mechanical Vibrations, Machine Design.

Professional Experience

Graduate AM Engineer, Irish Manufacturing Research –Dublin November 2025 – Present

- Component Development: Support the design and development of parts for additive manufacturing, ensuring suitability for printing and downstream use.
- AM Integration: Assist in integrating AM solutions into existing product lines.
- Design Support: Collaborate with design engineers to modify and optimize parts for manufacturability using CAD tools.
- Prototyping & Testing: Participate in prototyping and testing of 3D-printed components to ensure they meet functional and quality standards.
- Material Evaluation: Work with the team to explore and evaluate AM materials suitable for pharmaceutical-grade applications.
- Process Documentation: Assist in maintaining documentation for AM processes, materials, and design iterations.
- Collaboration: Work closely with design, R&D, and manufacturing teams to ensure seamless handovers from concept to production.
- Continuous Improvement: Contribute to process and design improvements through research and innovative application of AM technologies

Junior Design Engineer, Ansycad Solutions –India January 2022 – August 2024

- Created detailed 3D CAD models and 2D drawings with GD&T, BOMs, and assembly instructions in compliance with ISO and ASME standards with SolidWorks and NX for manufacturability.
- Performed FEA including linear, non-linear, fatigue, modal, and vibration studies to ensure structural integrity.
- Conducted CFD simulations for HVAC systems in military shelters, redesigning ducting layouts for uniform airflow distribution, and optimized thermal management of electronic housings and data center enclosures.
- Applied MBD to analyze dynamic loads, kinematics, and mechanism behavior; used DEM to study particle flow and bulk handling systems.
- Optimized designs through ribbing, material selection, and geometry refinement, achieving cost and weight reductions without compromising performance.
- Coordinated with manufacturing, testing, and procurement to resolve design issues, support tooling, and deliver assemblies on schedule.
- Collaborated with clients in design reviews, incorporating feedback to enhance product performance and customer satisfaction.

Key projects:

- Defense & Aerospace: Military shelters, Missile transporters, Missile launchers
- Transportation & Mobility: Trailers, Tippers, Military tank, Cranes
- Consumer Products: Pallets, Industrial ovens, and Chillers

Team Member, Team MH08 Formula Racing – India January 2019 – August 2020

- Supported chassis design and material selection using CAD tools for performance and safety optimization.
- Assisted in composite manufacturing and assembly, gaining hands-on fabrication experience.
- Supported sponsorship acquisition and managed social media outreach, boosting team visibility and funding.

Key Skills

CAD & Additive Manufacturing: SolidWorks, AutoCAD, NX, Creo, Autodesk Inventor, MSLA 3D printing

Simulation/Analysis Software: Ansys Workbench, Simcenter FLOEFD, Hypermesh, Motion View, Fusion 360

Design Standards: ISO, ASME, ASTM, MIL STD

Soft Skills: Team collaboration, Project management, Problem-Solving, Critical thinking

Programming Language: MATLAB, Python

Certifications & Memberships

- Certified SolidWorks Professional (CSWP), Dassault Systemes
- Becoming a HVAC Professional, Alison
- Project Management Essentials Certified
- Certified in Autodesk Fusion 360 Integrated CAD/CAM/CAE, Autodesk
- Member, American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)
- Member, Engineers Ireland

Research & Projects

Benchmarking and Optimizing Enhanced Natural Convection Heat Sinks August 2025
MSc Dissertation – Trinity College Dublin

- Developed a standardized methodology to benchmark, evaluate and optimize (DOE & HEEDS) the performance of heat sink designs under natural convection.
- Applied this framework to displacement fin designs, ensuring true optimum-to-optimum comparisons against straight-fin baselines.
- Demonstrated that optimized displacement fins improved total heat transfer by 9.53% (small fins) and 11.09% (large fins) compared to optimized straight fins.
- Showed that SV1 displacement fins delivered the best mass-specific efficiency (Q/m), achieving 5–6% higher performance than optimized straight fins, while SV2 and SV3 had negligible gains.
- Concluded that the method provides a credible benchmarking tool for evaluating trade-offs between overall heat transfer and weight-specific performance in future passive cooling designs.

Explore more innovative research projects at: thakurd9.github.io/Portfolio/